

Série 1 (suite et fin)

EX9

$$\begin{aligned}\frac{2}{\sqrt{2}(\sqrt{3}+1)} + \frac{2}{\sqrt{3}+1+\sqrt{2}} &= \frac{2(\sqrt{3}-1)}{\sqrt{2} \cdot 2} + \frac{2}{\sqrt{3}+1+\sqrt{2}} \\&= \frac{\sqrt{3}-1}{\sqrt{2}} + \frac{2}{\sqrt{3}+1+\sqrt{2}} \\&= \frac{\sqrt{2}(\sqrt{3}-1)}{2} + \frac{2}{\sqrt{3}+1+\sqrt{2}} \\&= \frac{(\sqrt{6}-\sqrt{2})(\sqrt{3}+1+\sqrt{2})+4}{2(\sqrt{3}+1+\sqrt{2})} \\&= \frac{3\sqrt{2}+\sqrt{6}+2\sqrt{3}-\sqrt{6}-\sqrt{2}-2+4}{2(\sqrt{3}+1+\sqrt{2})} \\&= \frac{2\sqrt{2}+2\sqrt{3}+2}{2(\sqrt{3}+1+\sqrt{2})} = 1\end{aligned}$$

EX10 a) $\sqrt{4+\sqrt{12}} \stackrel{?}{=} 1+\sqrt{3}$

$$4+\sqrt{12} \stackrel{?}{=} (1+\sqrt{3})^2 = 1+2\sqrt{3}+3$$

$$4+\sqrt{12} = 4+2\sqrt{3} \quad \text{OK car } \sqrt{12} = 2\sqrt{3}$$

b) $\sqrt{9-4\sqrt{2}} \stackrel{?}{=} \sqrt{8}-1$

$$\begin{aligned}9-4\sqrt{2} &\stackrel{?}{=} (\sqrt{8}-1)^2 = 8+1-2\sqrt{8} \\&= 9-4\sqrt{2} \quad \text{OK}\end{aligned}$$

c) $\frac{1}{1+\sqrt{2}} \stackrel{?}{=} \sqrt{2}-1$

$$\frac{1}{1+\sqrt{2}} = \frac{1-\sqrt{2}}{(1+\sqrt{2})(1-\sqrt{2})} = \frac{1-\sqrt{2}}{1-2} = \sqrt{2}-1 \quad \text{OK}$$

$$d) \frac{1-\sqrt{3}}{2+\sqrt{3}} = \frac{(1-\sqrt{3})(2-\sqrt{3})}{4-3} = \frac{2-\sqrt{3}-2\sqrt{3}+3}{1} = 5-3\sqrt{3}$$

$$e) \sqrt{7+4\sqrt{3}} + \sqrt{7-4\sqrt{3}} \stackrel{?}{=} 4$$

$$\begin{aligned} (\sqrt{7+4\sqrt{3}} + \sqrt{7-4\sqrt{3}})^2 &= 7+4\sqrt{3} + 7-4\sqrt{3} + 2\sqrt{7-4\sqrt{3}}\sqrt{7+4\sqrt{3}} \\ &= 14 + 2\sqrt{49-48} = 16 \end{aligned}$$

$$f) \frac{3}{2-\sqrt{5}} \stackrel{?}{=} -6-3\sqrt{5}$$

$$\frac{3}{2-\sqrt{5}} = \frac{3(2+\sqrt{5})}{4-5} = \frac{6+3\sqrt{5}}{-1} = -6-3\sqrt{5} \quad \text{☑}$$